System Wide Information Management (SWIM) for Global Air Traffic Management (ATM)

FAA/ATO-P (Operations Planning/Architecture and Engineering Program)

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April 2004

Agenda

- Definition
- Goals
- Description
- Technology
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- SWIM in the ATM Enterprise
- Schedule
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Definition of SWIM

Initiative to provide a common context for top-down, performance-oriented, secure integration and management of shared information assets across the global Air Traffic Management domain

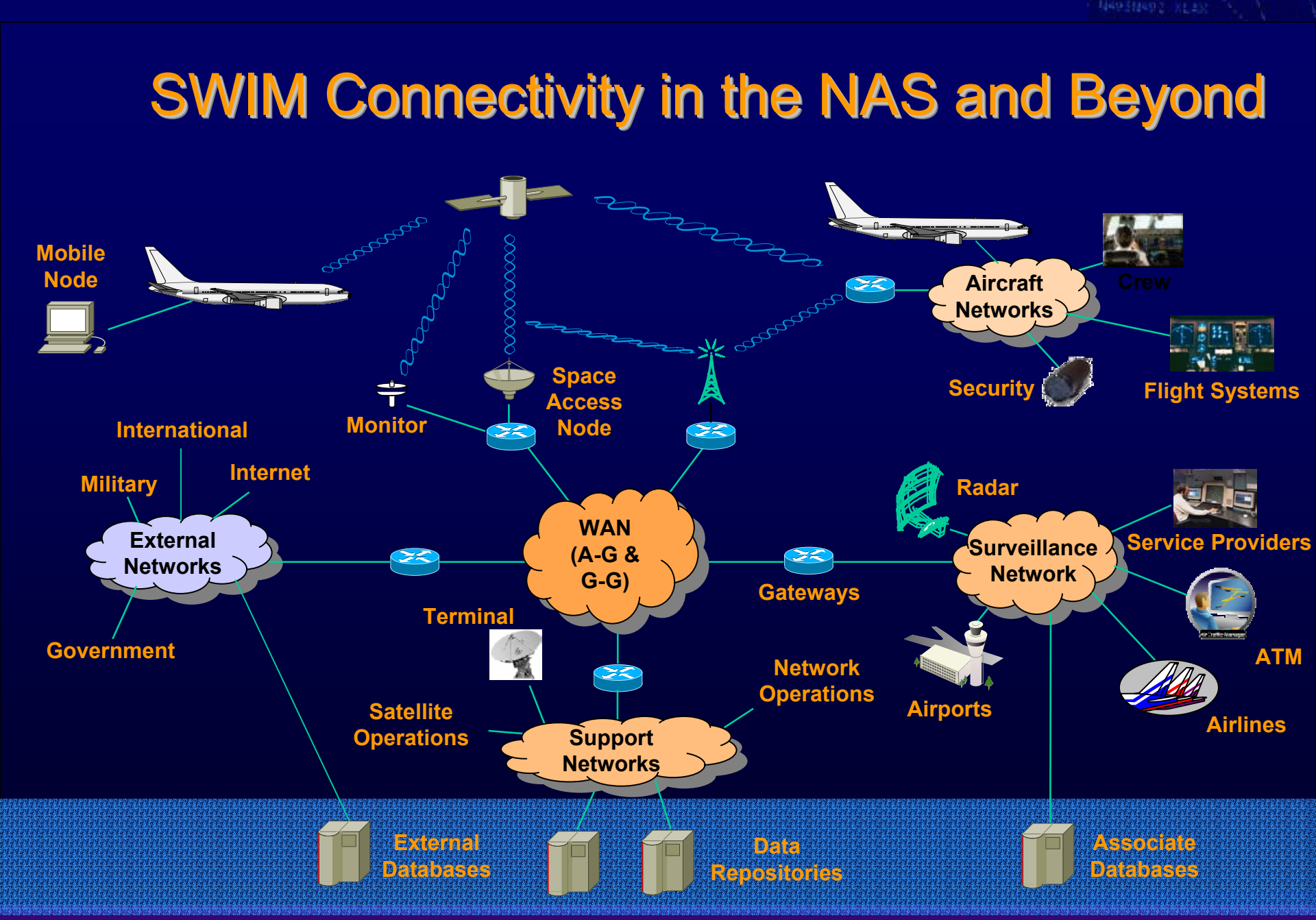
Goals

- Standardize an open, scalable, flexible approach for systems integration and information sharing for global ATM
- Expedite secure access and conveyance of vital information (e.g., surveillance, weather, flight planning, navigation, traffic flow)
- Tentative deployment of Build 1A in three phases by FY-09, FY-12, FY-15

Description

- SWIM concept adopts modern, available, secure information technology
- Holistic approach to exchange timely information among various ATM stakeholders
- Framework for consolidating legacy and future communications and application infrastructures
- Supports Air-Ground, Ground-Ground, mobile services

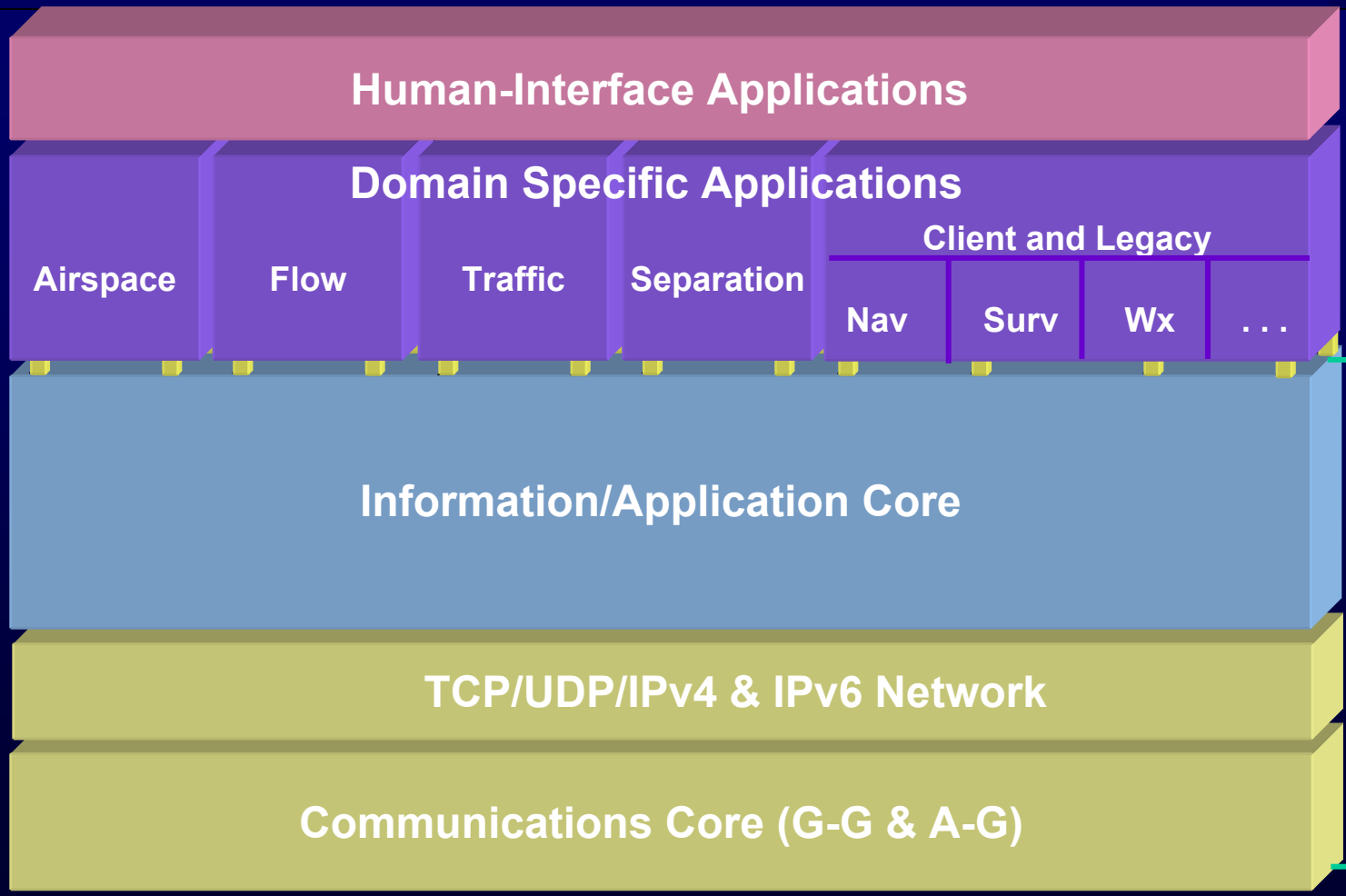
SWIM Connectivity in the NAS and Beyond



Description (Con't)

- Operates on a Web Services model for information retrieval and access
- Modular hardware and software concept for scalability and maintainability
- N-tier architecture and middleware to minimize component dependencies
- Integrated enterprise management, directory, user registration services

SWIM Layered Architecture



Interface standards define open architecture and promote interoperability

Technologies

- TCP/UDP/IPv4 -> v6 (Communication Core)
  - Mature, ubiquitous protocol, migrating to mobility, security, QoS, large address space
- XML (Application Core)
  - Tagging, filtering, contextual data display
- SNMPv3 (Application Core)
  - Secure, manager-manager and manager-agent enterprise management
- IPSec, PKI, SSL/TLS (Network/Application Core)
  - NAS- and ATN-compliant security protocol for network and higher layers

Technology (Con't)

- ATN, DoD, Service Provider standards
  - Compliance with stakeholder standards to promote global interoperability
- MPLS
  - VPN at link layer, connection-oriented, common interface among protocols (e.g., Frame Relay, Asynchronous Transfer Mode)
- Standards specifically being ignored
  - X.25 (Vanishing vendor support)
  - ISO/OSI (Expensive, not widely deployed)
  - Aeronautical Fixed Telecommunications Network (AFTN – Slow, obsolete)

Team/Resources

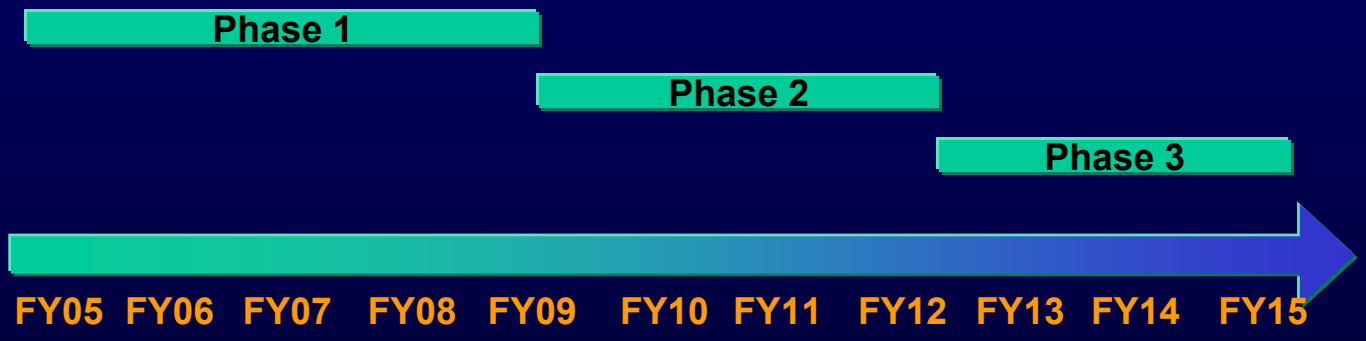
- Required Assets
  - People
    - FAA, Eurocontrol, NASA, DoD, RTCA, ICAO
  - Hardware/Software
    - Servers, Routers, Protocol stacks, Switches, Communication Links, Radios, Gateways
  - Locations
    - Air Traffic Management Facilities
  - Contractor support
    - Boeing, ITT, BAE Systems

SWIM in the ATM Enterprise

- Collaboration with non-FAA entities (e.g., other Federal Agencies, Service Providers, International users and Airlines)
- Memoranda of Understanding or Agreement (MOU, MOA) to enable coordinated effort
- Interface with NAS infrastructure (e.g., FTI, FAATSAT)

Tentative Schedule

- SWIM Build 1A



Progress to Date

- High-level overview of progress
  - FAA Surveillance Data Network is adopting SWIM concept
  - Three working groups identified
    - Policy
    - Technology
    - Transition
  - Working groups have convened, and are drafting their strategies
  - NASA, Boeing, DoD, FAA and contractors have developed concept analysis papers for Common Information Network (CIN)/SWIM

Related References

- NAS ConOps and Vision for the Future of Aviation
  - RTCA Select Committee for Free Flight, Fall ‘02
- ConUse for GCNSS
  - FAA/NASA/Boeing, 8/29/03
- CIN/SWIM Preliminary Concept Development Analysis
  - Boeing Air Traffic Management, D794: 2003
- Submit questions
  - Steve Bradford, Chief Scientist, 202-385-7245

www.ato.faa.gov